

### Section 3. ENGINE NACELLE

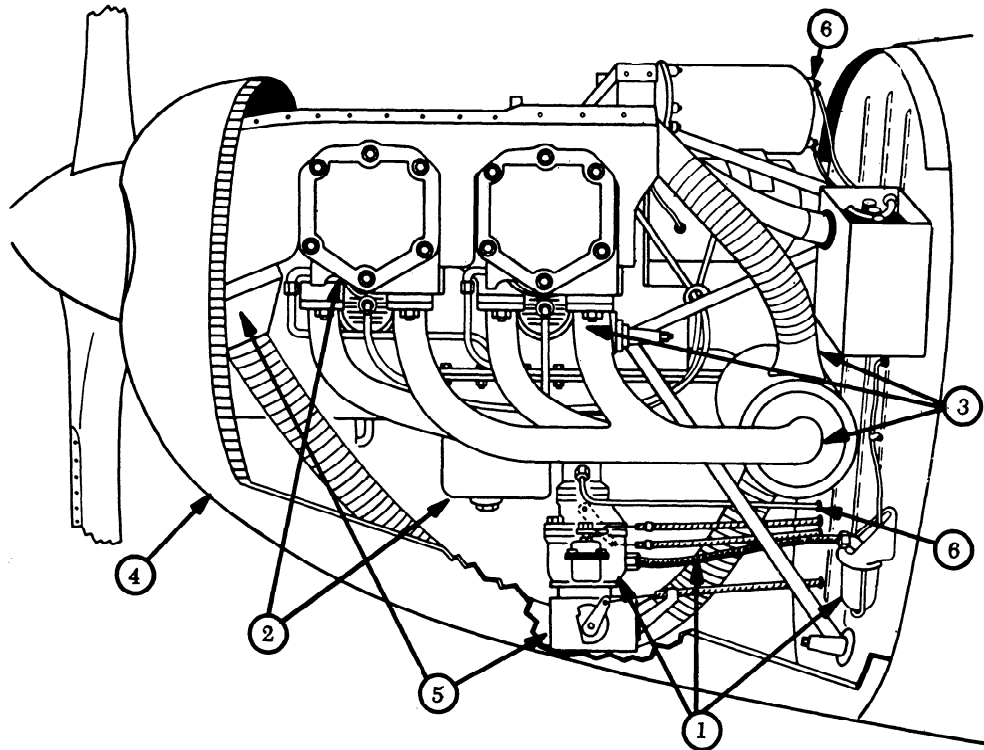
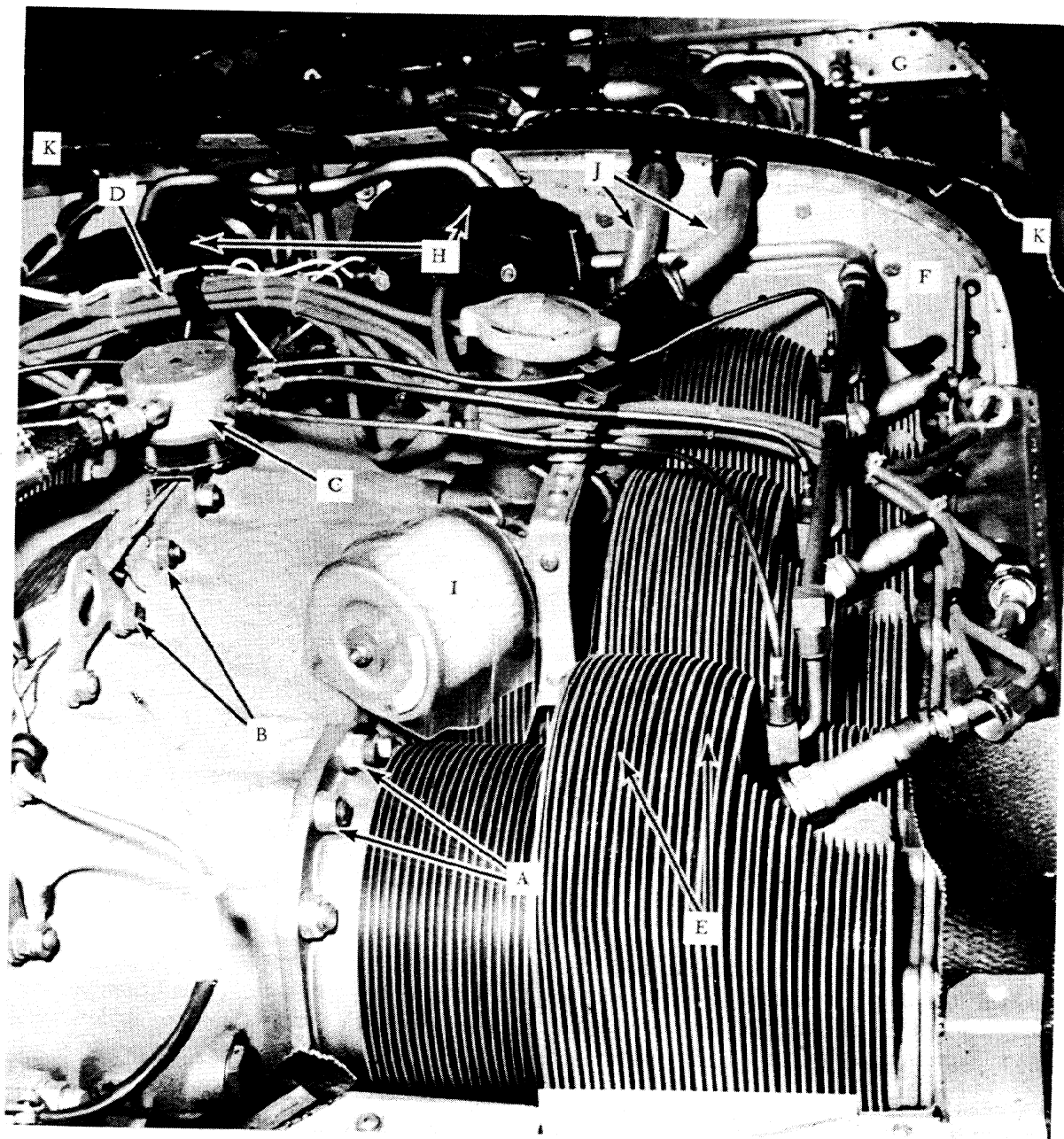


FIGURE 3-1. Inspection chart — engine and nacelle.

1. **FUEL SYSTEM**—Look for signs of fuel dye which indicates a fuel leak. Visually check a small amount of fuel in a clear container, and drain sumps for water.
2. **OIL SYSTEM**—Check for indication of leaks. Check oil quantity.
3. **EXHAUST SYSTEM**—Check for gray-white stains, which are indications of exhaust leaks at the cylinder head or cracks in stacks. Check condition of heat mufflers for cracks or leaks.
4. **COOLING AIR SYSTEM** (cowling and baffles)—Check for cracks in cowling and baffles. Check for proper positioning of baffles, condition of seals, and security of fasteners.
5. **INDUCTION AIR SYSTEM** (air filter)—Check for proper installation, condition, cleanliness, possible restrictions to airflow, and system air leaks.
6. **OTHER SYSTEMS**—Check for proper installation and for cleanliness.  
Remove and inspect the fuel strainer screens for damage and water or dirt contamination. Clean screens, replace, and safety.  
When reassembling the fuel strainer bowl, care must be exercised when tightening the bale wire. Insufficient tightening may result in leakage; excessive pressure may damage the bowl. Be sure trapped air is eliminated, ensuring unrestricted fuel flow. With fuel



- |                                |                                       |
|--------------------------------|---------------------------------------|
| A. Cylinder hold-down nuts.    | G. Accessory section.                 |
| B. Crankcase thru-bolts.       | H. Magnetos.                          |
| C. Fuel injection distributor. | I. Instrument system pressure filter. |
| D. Ignition harness.           | J. Oil lines.                         |
| E. Cylinder cooling fins.      | K. Cowling seals.                     |
| F. Firewall.                   |                                       |

FIGURE 3-2. Inspection chart — engine.

selector and boost pump on, check the fuel strainer for leaks. Inspect fuel lines and connections for leakage, cracks, kinks, chafing, and security of mounting. Examine hoses and clamps for tightness and condition. Ensure that fuel lines do not interfere with adjacent equipment or lines.

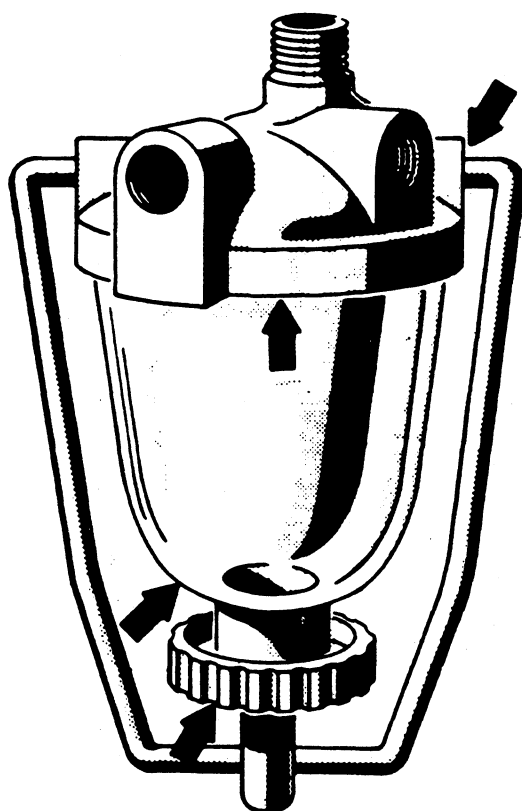


FIGURE 3-3. Fuel strainer checkpoints.

Examine the primer system for general condition and perform an operational check. Inspect for leakage and security of attachment. Ensure that all connections are tight. Copper primer lines should be periodically annealed to relieve brittleness, by a person authorized by FAR 43.

Inspect the carburetor for general condition, security of attachment, and defects. Inspect for excessive wear at throttle shaft, link assemblies, and hot air butterfly shaft bearing points. Wear can affect the fuel-air mixture resulting in erratic engine operation. Inspect

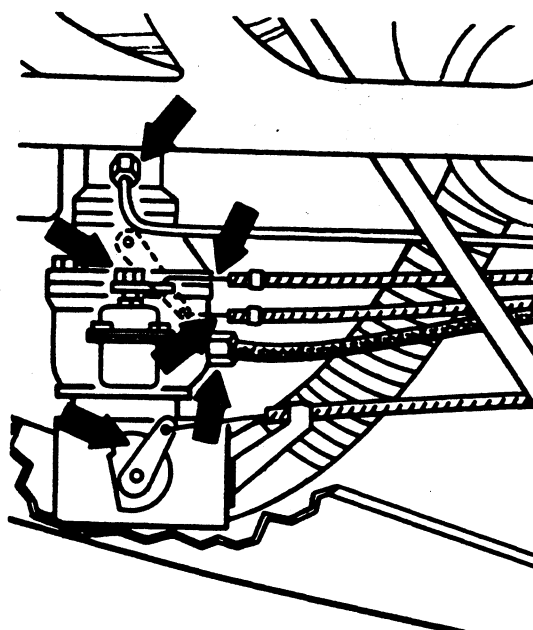


FIGURE 3-4. Carburetor inspection points.

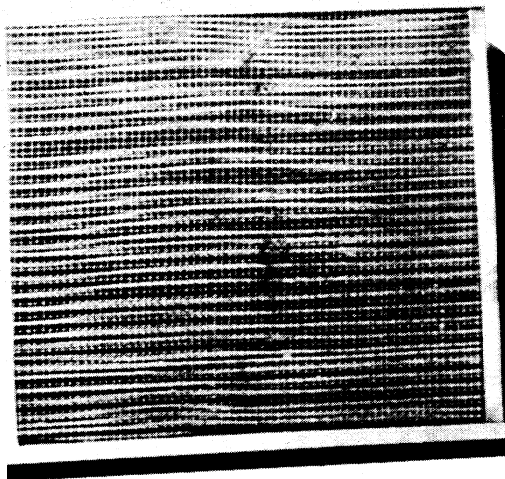
for leaks due to damaged gaskets, loose fittings, or damaged fuel lines. Drain carburetor bowl and examine the gasoline for presence of water or other contamination. Remove and clean carburetor screens and inspect for damage. Flush carburetor by turning fuel supply on momentarily. Replace screens and drain plugs and ensure they are properly safetied.

Remove the carburetor air filter. Clean and inspect for defects. Inspect all air ducts for condition, alignment, and security. Reinstall filter.

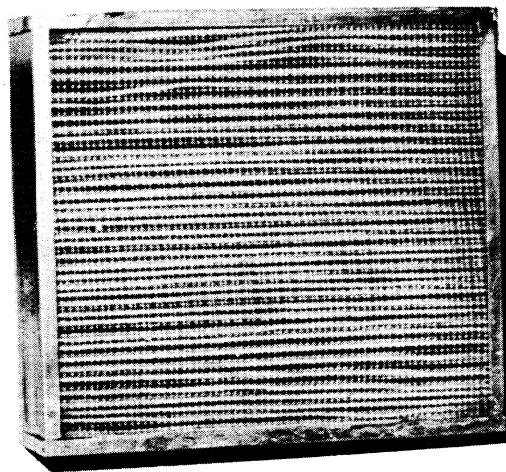
Inspect the carburetor air heater for condition and security. Operate the controls through the full travel range. If a questionable condition is found, contact a certificated repair station, mechanic, or the manufacturer for repairs.

The air filter and air heater are critical inspection items. Either can restrict the intake airflow and result in loss of engine power. Follow manufacturer's instructions at all times.

Examine intake manifolds for general condition, cracks, kinks, and evidence of leakage. Ensure that upper and lower packing nuts are tight and not leaking.



A. Before cleaning.



B. After cleaning.

FIGURE 3-5. Carburetor air filters.



FIGURE 3-6. Intake manifold checkpoints.

If leaks around the intake pipe packing nut cannot be corrected by tightening the nut, the packing must be replaced. Use approved parts

when replacements are necessary. Replacement must be done by persons authorized in FAR 43.

Inspect the oil tank for evidence of cracks or oil leaks, especially around welded seams

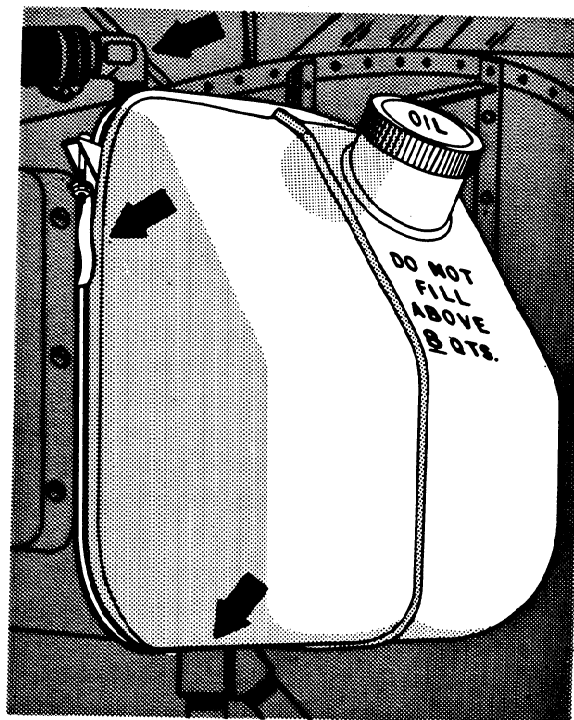


FIGURE 3-7. Oil tank inspection.

and fittings. Leaks should be traced to their source and corrected.

Check the oil tank retainer straps for evidence of chafing and for security of attachment. If chafing has occurred or the proper security cannot be obtained, antichafe pad replacement is necessary.

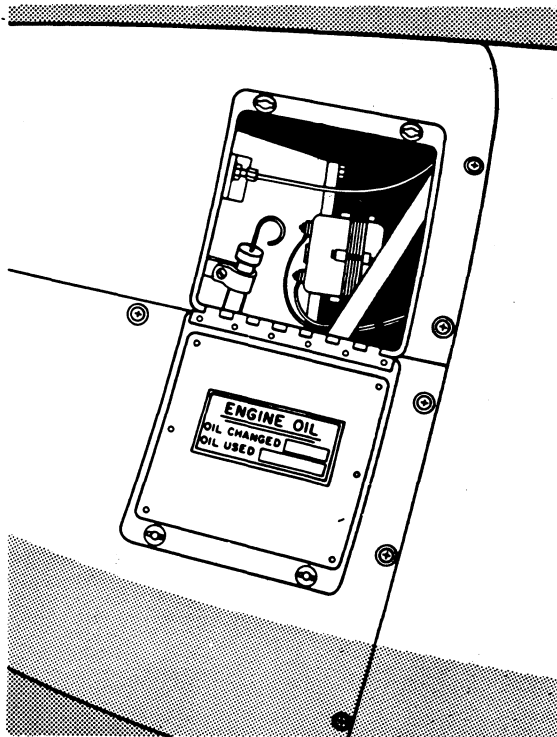


FIGURE 3-8. Oil quantity check.

On wet sump engines, inspect the sump for evidence of leaks. Remove oil sump plug and inspect for foreign particles. Remove, inspect, and clean oil sump strainers. Reinstall drain plugs and strainers, and safety immediately. The presence of metal particles usually indicates an internal failure. It will be necessary to make a thorough internal inspection of the engine which, in most cases, requires a complete engine disassembly. Fill the system with the type and grade of oil recommended by the manufacturer, for the climatic conditions to be encountered.

Inspect oil lines for leakage and security of attachment, particularly at connections. Oil hoses should be inspected for exterior checks



FIGURE 3-9. Satisfactory oil line installation.

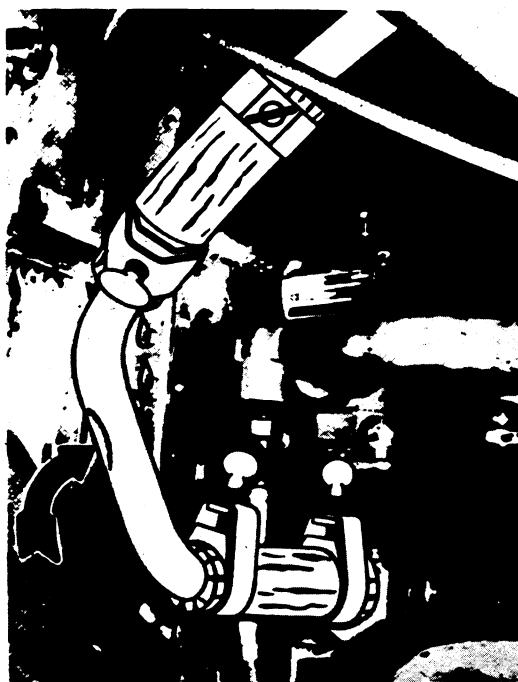


FIGURE 3-10. Unsatisfactory oil line installation.

and cracks, and proper tension and location of clamps. Any leaks must be repaired immediately.

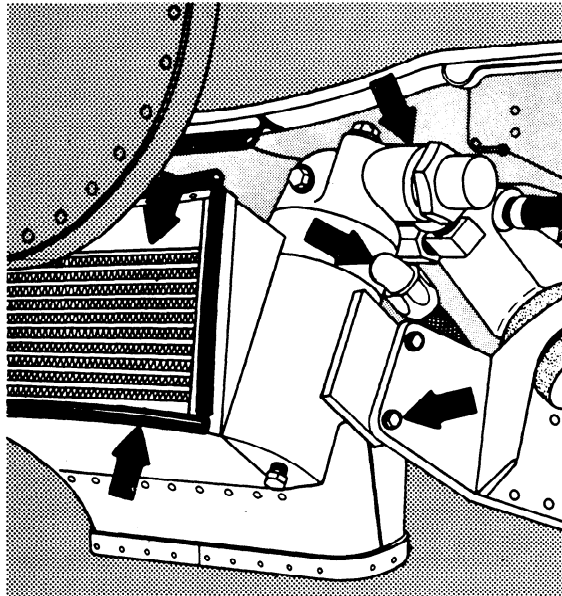


FIGURE 3-11. Oil-cooler checkpoints.

If the lubrication system incorporates an oil cooler or radiator, examine it very carefully for leaks, defects, and security of mounting.

Any leaks or defects will require replacement of the unit before further service.

Using a torque wrench, check the tightness of the spark plugs to the torque recommended by the manufacturer.

Examine ignition wiring and connections for general condition. Inspect spark plug barrels, elbows, and knurled nuts for proper tightness. Inspect shielding and bonding for condition and security.

Periodically inspect spark plug "cigarettes" for cleanliness, cracks, and broken spring contacts. Figure 3-13 shows a burned spark plug cigarette. For maximum efficiency of the ignition system, this spark plug cigarette should be replaced.

#### CAUTION

If your engine is a gas-turbine type, its ignition system is entirely different from that used on reciprocating engines. Work on turbine engine ignition systems can result in **SEVERE BODILY INJURY OR DEATH** due to electrical shock, unless you are fully familiar with recommended procedures. Figure 3-14 shows the normal condition of a gas turbine igniter plug and illustrates how they differ from spark plugs

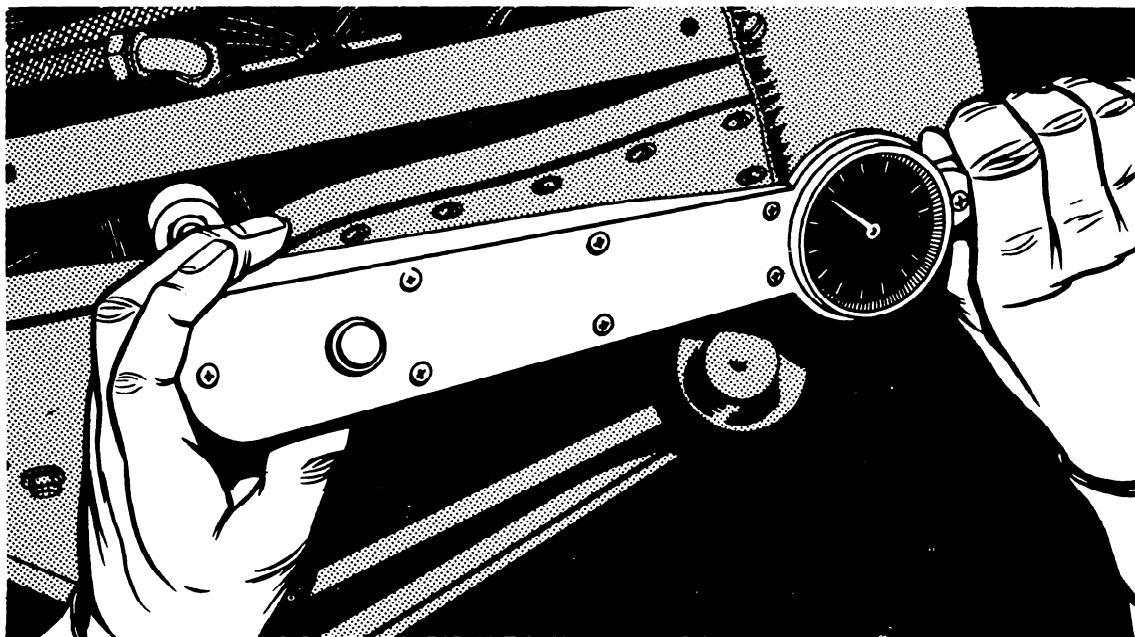


FIGURE 3-12. Checking sparkplug torque.

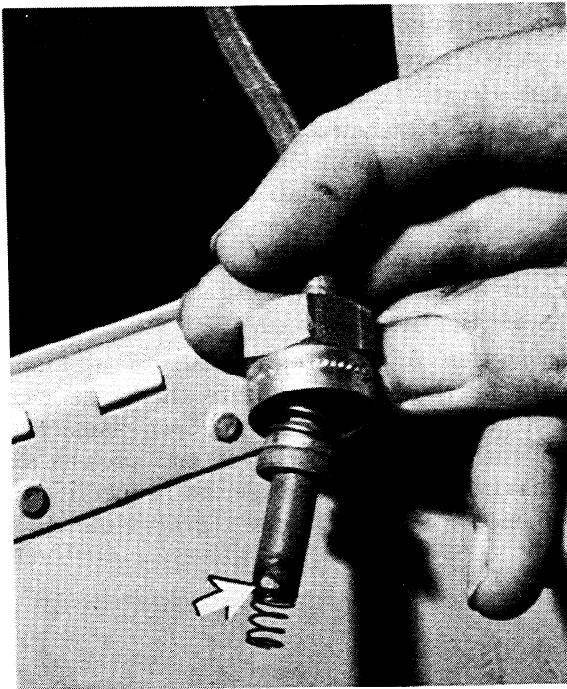


FIGURE 3-13. Unsatisfactory sparkplug cigarette.

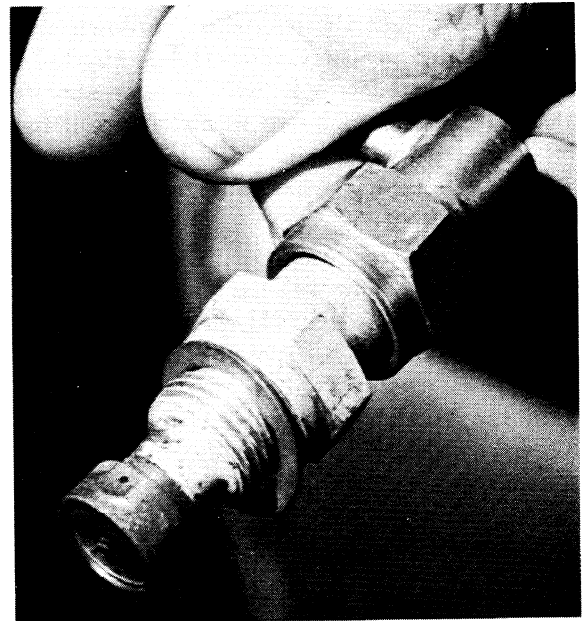


FIGURE 3-14. Igniter plug – gas turbine engine.

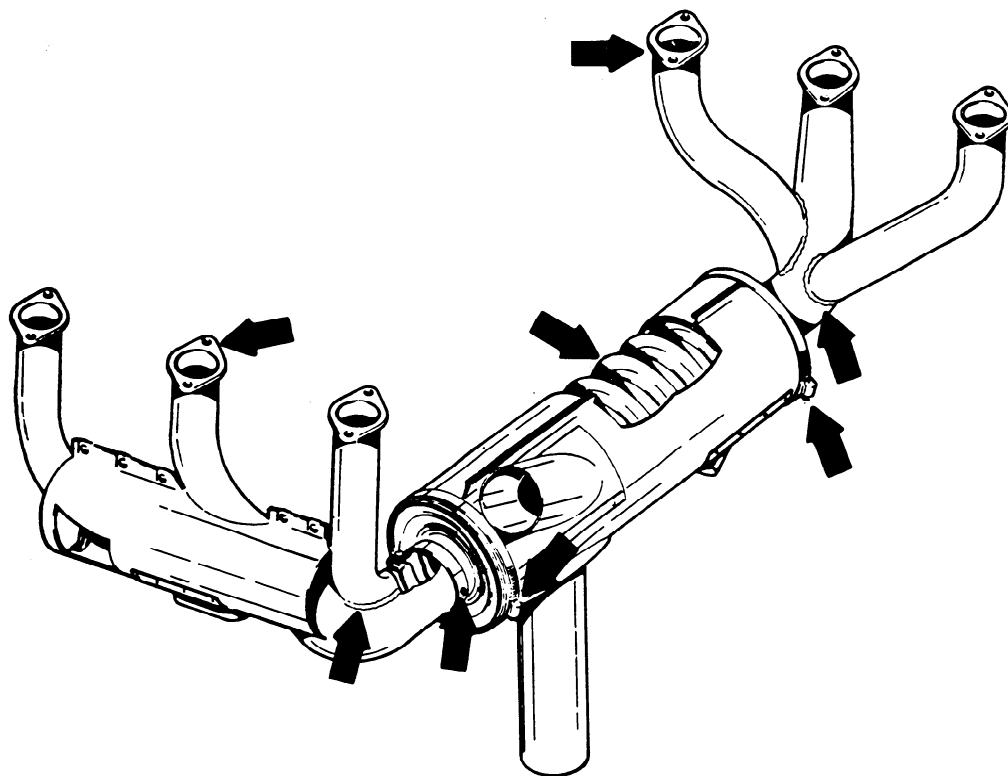


FIGURE 3-15. Exhaust manifold checkpoints.